Standard:

6th Grade 6.N.3.1 Students are able to use various strategies to solve one- and two-step problems involving positive decimals.

Purpose:

The students will solve problems involving positive decimals and explain what strategy they used to solve the problems.

Materials needed:

- List of story problems involving positive decimals

Instructions:

1. Put the students in pairs.
2. Hand out a story problem to each pair of the students. Example: Tom bought one pair of jeans for $19.95 and 2 shirts for $14.99 each. He gave the clerk $60.00. What is his change? Explain the strategy and justify the answer. (Strategy: You multiply 2 times $14.99 and then add $19.95 to it. Next you subtract the final sum from $60.00. Answer is $10.07.)
3. Take turns having the students read their story problems and explain the strategies used to get their answers.
4. If the students are correct, choose what sport skill you want the whole class to mimic. Examples are:

- Shooting a jump shot
- Running through tires
- Dunking a basketball
- Batting a baseball
- Swimming underwater
- Serving a tennis ball
- Throwing a football
- Shooting a hockey puck
- Downhill skiing
- Shooting an arrow
- Spiking a volleyball
- Juggling a soccer ball
- Swinging a golf club
- Fielding a ground ball and throwing it to first base

5. Continue until all students have read their problem.

Adaptations:

- You could have the students write their own story problems using positive decimals.

References:

- www.ncpe4me.com

Standard:

7th Grade 7.N.1.1 Students are able to represent numbers in a variety of forms by describing, ordering, and comparing integers, decimals, percents, and fractions.

Purpose:

Students will find their own batting averages.

Materials needed:

- Bats and balls
- Paper and pencils

Instructions:

1. Students will line up in small groups.
2. Take turns batting. Record whether the students strike out or hit the ball.
3. Give each students several times at bat.
4. Add up the times each student successfully hits the ball. (Fouls and walks don't count).
5. Divide the number of successful times at bat by the number of times up to bat to find each student's batting average.

Adaptations:

- Play kickball instead of baseball.
- Throw paper wads at wastebasket.
- Shoot basketballs at a basket.

References:

- Real World Math by Cindy A. Littlefield

Standard:

8th Grade 8.A.3.1 Students are able to describe and determine linear relationships.

8th Grade 8.A.4.1 Students are able to create rules to explain the relationship between numbers when a change in the first variable affects the second variable.

Purpose:

Students find relationships between numbers when the first variable affects the second variable. Students graph linear equations and find the slope from a line or ordered pairs.

Materials needed:

- Coordinate plane or graph paper
- Boxes, books, or anything of uniform size that students can stack
- Table for recording findings
- Pencils

Instructions:

1. Place students in groups (number in each group will vary depending on supplies and class size).
2. Students measure the depth of one book/box and record.
3. Students stack one book/box on top of the other.
4. Students' measure the depth of two books/boxes and record.
5. Repeat as necessary.
6. Use record sheet to graph ordered pairs on a coordinate plane.
7. Find slope of the line.

Adaptations:

- None

References:

- None

Standard:

6th Grade 6.A.1.1 Students are able to use order of operations, excluding nested parentheses and exponents, to simplify whole number expressions.

7th Grade 7.A.1.1 Students are able to write and evaluate algebraic expressions using the set of whole numbers.

7th Grade 7.A.2.1 Students are able to write and solve one-step 1st degree equations, with one variable, using the set of integers and inequalities.

8th Grade 8.A.1.1 Students are able to use properties to expand, combine, and simplify 1st degree algebraic expressions with the set of integers.

8th Grade 8.A.2.1 Students are able to write and solve two-step 1st degree equations, with one variable, and one-step inequalities, with one variable, using the set of integers.

Purpose:

Students will evaluate problems using correct order of operations.

Materials needed:

- Labels for each corner of the classroom (A, B, C, & D)
- Problems, pencils and paper

Instructions:

1. Teacher will present a problem with multiple choice answers (A, B, C, D).
2. Students complete problem at desk.
3. When students are finished they will stand up, and hop-two (2) hops in the direction of the corner which corresponds with the correct solution (A, B, C, D).

Adaptations:

- May be used to review a variety of math concepts.

References:

- None

Standard:

8th Grade 8.S.2.1 Students are able to find the sample space and compute probability for two simultaneous independent events.

Purpose:

Students will compute the probability of two independent events.

Materials needed:

- Desks or stations labeled "right/left hand, eye color, hair color, shirt color, glasses/no glasses, male/female
- Probability problems
- Form for data collection
- Paper and pencils

Instructions:

1. Students travel to each station and record personal information at each station.
2. A different student collects data from each station and records it on the board as a ratio.
3. Teacher poses a probability problem (Ex., What is the probability that a male student wears glasses?)
4. Students use class information to determine probability

Adaptations:

- May use less or more categories of information. May find probability of more than two independent events.

References:

- None

Standard:

8th Grade 8.S.1.1 Students are able to find the mean, median, mode, and range of a set of data from a stem-and-leaf plot and a line plot.

Purpose:

Students will create a stem and leaf plot and line plot. Then, students will use these graphs to determine mean, median, mode and range.

Materials needed:

- Paper and pencils
- Recording paper

Instructions:

1. Each student will display the number of siblings he/she has at the front of the room using digits on his/her hands.
2. Use sibling data to create a stem-and-leaf plot and line plot of recording paper.
3. Determine mean, median, mode and range using the stem-and-leaf plot and the line plot utilizing the students in the classroom.
4. After the mean, median, mode and range have been found by each group, the teacher will randomly ask each group define their answers, using movement, what the mean, median, mode or range was of the information they plotted.

Adaptations:

- None

References:

- None

Free Throw Face-Off
Probability of Dependent Events

Standard:

7th Grade 7.S.2.1 Students are able, given a sample space, to find the probability of a specific outcome.

8th Grade 8.S.2.1 Students are able to find the sample space and compute probability for two simultaneous events.

Purpose:

Students will demonstrate one-on-one free throw situation. They will determine probability of dependent events.

Materials needed:

- Basketball hoop and basketball
- Recording paper
- Paper and pencils

Instructions:

1. Teacher tells story of your school playing in the state basketball championship against a rival school. The score is 79-78 in favor of the opposing team. If a player on your team was fouled and had the opportunity to shoot one-on-one free throws, would the game end in a tie, win, or loss?
2. Each student will demonstrate a one-on-one situation ten times. Remember, if you miss the first shot, you don't get to shoot a second shot.
3. Record results of first shot, second shot, and point for each of the ten times shooting.
4. Determine the probability of winning, losing, or ending in a tie for each student.
5. Which student would you want to have shoot the basketball for your teams?
6. Express the probability of winning, losing, and ending in a tie as a decimal, fraction, and percent.

Adaptations:

- May compile results and determine as a fraction, decimal, and percent.

References:

- Probability and Statistics by Margaret Thomas

Standard:

6th Grade 6.G.1.1 Students are able to identify and describe characteristics of triangles and quadrilaterals.

7th Grade 7.G.1.1 Students are able to identify, describe, and classify polygons having up to ten sides.

7th Grade 7.G.1.2 Students are able to identify and describe elements of geometric figures.

8th Grade 8.G.1.1 Students are able to describe and classify prisms, pyramids, cylinders, and cones.

Purpose:

Students will create geometric figures in teams.

Materials needed:

- Gym floor

Instructions:

1. Divide students into two teams. Place them at the centerline.
2. Teacher will call out one of the geometric figures that students have studied.
3. Each team must create that shape using all team members.
4. Retaining the shape, students race the to the end line.
5. Proclaim a winner.
6. Teacher then calls out another shape and continue play, this time racing to the centerline.

Adaptations:

- None

References:

- None

Standard:

7th Grade 7.N.2.1 Students are able to add, subtract, multiply, and divide integers and positive fractions.

Purpose:

Students will add beginning integers.

Materials needed:

- Large number line (-10 to +10) on sidewalk or on classroom/gym floor
- Sidewalk chalk or masking tape

Instructions:

1. Students draw large number lines on sidewalk using chalk.
2. Teacher directions for class:
   - Students start at zero, facing the positive numbers
   - For any positive number, students move forward that number of spaces
   - For any negative number, students move backward that number of spaces
3. Teacher poses a simple integer problem, like 4 + -3
4. Students walk forward 4 spaces (+4), then backward three spaces (-3).
5. Students should be standing on the answer, 1.
6. Repeat as needed.

Challenge: For subtracting integers, instruct students to "turn around (in opposite direction) for the subtraction sign (-).

Adaptations:

- The quantity of number lines depends on size of class and space available.

References:

- Minds in Motion 2004, page 36.

Polygon Scavenger Hunt

Standard:

6th Grade 6.G.1.1 Students are able to identify and describe the characteristics of triangles and quadrilaterals.

7th Grade 7.G.1.1 Students are able to identify, describe, and classify polygons having up to ten sides.

Purpose:

Students will find various polygons throughout the classroom/school.

Materials needed:

- List of polygons and/or pictures of polygons
- Note cards
- Sticky notes
- Pencils

Instructions:

1. Distribute the list of polygons.
2. Instruct students to find as many different examples of each polygon in the classroom/school and record on sticky notes or notecards.
3. Compile results at the front of the room

Adaptations:

- None

References:

- None

Standard:

6th Grade 6.N.2.1 Students are able to add, subtract, multiply, and divide decimals.

6th Grade 6.N.3.1 Students are able to use various strategies to solve one- and two-step problems involving positive decimals.

Purpose:

Apply number operations with real numbers and other number systems. Develop conjectures, predictions, or estimations to solve problems and verify or justify the results.

Materials needed:

- Notebook (call it "Risk Pad")
- Small basketball hoop
- Scrap paper
- Pencils

Instructions:

1. Give students one problem at a time to solve.
2. Students write and estimate the problem in their notebook.
3. Discuss what correct answer should be.
4. Whole class discussion will follow about answers.
5. Students with incorrect answers may tear the paper out of the Risk Pad (notebook), form a ball, and shoot a basket.
6. For the students with the correct answer, they will collect and save paper balls until end of game.
7. Give students more problems and repeat the above steps.
8. When session is finished students with paper balls may shoot them.

Adaptations:

- None

References:

- None

Standard:

6th Grade 6.S.2.1 Students are able to find probability of a simple event.
7th Grade 7.S.2.1 Students are able, given a sample space, to find the probability of a specific outcome.

Purpose:

Students will use the game, Rock, Paper, Scissors, to determine probability.

Materials needed:

- Short staircase or several pieces of paper in a line
- Paper and pencils

Instructions:

1. Divide students into pairs.
2. Each pair starts at the bottom of the staircase or at the start of the paper pieces. They play Rock, Paper, Scissors. (Paper covers rock, rock breaks scissors, scissors cut paper).
3. The winner moves up one step or forward to the next paper. Keep playing until one student reaches the top/end.
4. Play the game four times, recording the winner each time.
5. Determine the probability of each player winning the game as a fraction, decimal and percent. Did each player win 50% of the time?

Adaptations:

- None

References:

- Real World Math by Cindy A. Littlefield

Standard:

7th Grade 7.A.3.2 Students are able to model and solve multi-step problems involving rates.

7th Grade 7.S.1.1 Students are able to find mean, median, mode, and range of a set of data.

7th Grade 7.S.1.2 Students are able to display data using frequency tables, line plots, stem and leaf plots, and make predictions.

Purpose:

Students will compete in School Yard Olympics as an introduction to distance, rate and time. They will record information.

Materials needed:

- Feathers, chair, cones, or cans
- Basketball
- Popcorn
- Stopwatch
- Large sack
- Driveway of gym
- Tape measure
- Optional-Awards

Instructions:

1. Feather Flight: Students try to keep a feather in the air as long as possible by blowing under it.
2. Driveway Dribble: Set a chair or cone at the end of driveway or gym. Students dribble a basketball around the chair and back.
3. The Can Can: Arrange cans or cones in a straight line, leaving a short distance between each. Competitors weave through the cans/cones while in the sack from start to finish.
4. Popcorn Pitch: Students compete to see who can "pitch" a piece of popcorn the farthest in 30 seconds.
5. Record times & distances.
6. Compile results and create graphs for each event. Use bar graphs, stem and leaf plots, and line plots, for example.
7. Find the mean, median, mode, and range for each event.
8. Make predictions for future events.

Adaptations:

- May award points for places based on results and award Olympic Gold, Silver, and Bronze medals. Extension. Find the rate of speed for dribbling and sack race.

References:

- Real World Math by Cindy A. Littlefield

Standard:

8th Grade 8.G.2.1 Students are able to write and solve proportions that express the relationships between corresponding parts of similar quadrilaterals and triangles.

Purpose:

Students will find similar figures using proportions.

Materials needed:

- Pairs of similar triangles and quadrilaterals. Each figure must have two corresponding dimensions labeled.

Instructions:

1. Distribute one figure to each student.
2. Using proportions, students will find another student holding the similar figure.

Adaptations:

- None

References:

- None

Standard:

6th Grade 6.M.1.1 Students are able to select, use, and convert appropriate unit of measurement for a situation.

7th Grade 7.M.1.2 Students, when given formulas, are able to find circumference, perimeter, and area of circles, parallelograms, triangles, and trapezoids (whole number measurements).

Purpose:

Students will identify correct standard measurement conversions.

Materials needed:

- For each group: quart, gallon, cup, pint, 12" ruler, yardstick
- List of conversions

Instructions:

1. Divide students into groups.
2. Teacher will call out a conversion. For example, "3 of these equal one yard."
3. The first student in each group picks up the appropriate representation and returns to their group.
4. Continue for each person in the group

Adaptations:

- Use approximate metric and standard equivalents

References:

- None

Standard:

6th Grade 6.A.1.2 Students are able to write algebraic expressions involving addition or multiplication using whole numbers.

Purpose:

Students will match operation symbols to other words also used to define expression.

Materials needed:

- Label 4 corners/walls of room with (+, -, x, ÷)
- List of expressions

Instructions:

1. Students will form teams.
2. Teacher will read an expression.
3. On teacher command, the first student in each line will move to the corner/wall with correct symbol which matches the operation in the expression read.
   ("-" hop, "+" twist, "x" skip, "÷" run)
4. Example: The dogs were decreased by one when the family adopted a new family pet. Students move to the "-"
5. Repeat until all students have moved.

Adaptations:

- None

References:

- None

Standard:

6th Grade 6.G.1.1 Students are able to identify and describe the characteristics of triangles and quadrilaterals.

Purpose:

Students will identify different angles using matching skills.

Materials needed:

- Cards with pictures of angles
- Cards with corresponding names for angle

Instructions:

1. Give each student an angle picture or corresponding name cards.
2. Students will walk around the room and find the student who has the angle pictures or word which matches what he/she has in hand.
3. When the students have found their matching partner they will go back to their desks and sit.
4. When all students are seated, with their partner they will do jumping jacks for the angle they have matched. (Triangle-three (3) jumping jacks) Students will guess the angle.
5. Continue until all have performed.

Adaptations:

- May place pictures on a wall or board.

References:

- None

The Perfect Circle
(Duck Duck Goose)

Standard:
7th Grade 7.G.1.2 Students are able to identify and describe elements of geometric figures.

Purpose:
Students will construct a "perfect circle". They will identify parts of the circle.

Materials needed:
- Two sturdy sticks or one stick and one piece of chalk and 8' rope
- Gravel or paved parking lot

Instructions:
1. Have one student hold a stick to the ground, keeping it in its original position throughout the activity.
2. Tie the rope to the stick.
3. Tie the other end of the rope to the lower end of the second stick/chalk.
4. Holding the second stick, another student walks away from the stick and keeps the rope tight without pulling on the first stick. The student continues to walk, drawing a line on the ground with the second stick/chalk to create a "perfect circle." Mark the center point.
5. Remove the sticks and the rope. Draw lines across the circle to divide it into eight equal pizza-shaped pieces. Each line must run through the center point of the circle.
6. Have students skip the circumference of the circle, walk the diameter, or crawl across a radius.
7. Play "Pi Tag." Choose one student to be "it." That student stands in the center of the circle, while the other players stand anywhere on the edge of the circle. Students can run in any direction as long as they stay on one of the lines. Center of circle acts as "base."

Adaptations:
- Students may make the circle in dirt using sticks and a shovel.
- Students may play this game in the snow.

References:
- Real World Math by Cindy A. Littlefield

Standard:

7th Grade 7.N.1.1 Represent numbers in a variety of forms by describing, ordering and comparing integers, decimals, percents and fractions.

Purpose:

The students will be able to order numbers in a variety of forms.

Materials needed:

- Cards with integers, whole numbers, decimals, fractions, and percents

Instructions:

1. Distribute one card to each student.
2. In groups of three, order the cards from least to greatest.
3. One at a time, each group will add their three cards to the board in order from least to greatest.
4. Upon teacher command, students will:
   - Clap three times if all three cards are in correct order
   - Clap two times if two cards are in the correct order
   - Clap one time if one card is in the correct order
5. Each group will make appropriate corrections.
6. Students will clap again.
7. Repeat process for other groups.

Adaptations:

- None

References:

- None

Standard:

7th Grade 7.G.2.1 Students are able to demonstrate ways that shapes can be transformed.

Purpose:

Students will identify translations, reflections, and rotations.

Materials needed:

- Slips of paper labeled translation, reflection, rotation
- List of transformations

Instructions:

1. Students will work in pairs
2. One student lies out on the floor
3. The partner draws a card and performs the correct transformation

Adaptations:

- Teacher calls out the transformations instead of drawing them

References:

- Minds in Motion, 2004, page 60

Standard:

8th Grade 8.G.1.2 Students, when given any two sides of an illustrated right triangle, are able to use the Pythagorean Theorem to find the third side.

Purpose:

Students will find the length of the hypotenuse of a right triangle.

Materials needed:

- Boxes with no tops. The corners should be cut so it lies flat.
- 4 straws for the hypotenuse of each side of the box
- Clay, fun tack, chewing gum (adhesive)
- Paper for recording
- Rulers

Instructions:

1. Group students.
2. Distribute a box and 4 straws to each group.
3. Explain that the box is like a building under construction. The students are to place the walls at a 90-degree angle from the base of the building so the building will not topple over.
4. Using straws and adhesive, students will place one straw on each side of the building so that the wall sits at a 90 degree (right angle) to the base of the building.
5. Students will measure the vertical (a) and horizontal (b) distances of the right angle and record.
6. Use the Pythagorean Theorem (a2 + b2 = c2) to determine the length of the hypotenuse, c, given a and b.
7. Measure the length of the straws and compare to hypotenuse length, c, found in step 6.

Adaptations:

- None

References:

- None

Standard:

8th Grade 8.A.4.2 Students are able to describe and represent relations using tables, graphs, and rules.

Purpose:

Students will represent relations using tables and graphs.

Materials needed:

- Yardsticks or measuring tape
- Overhead of coordinate plane (0-80 by 5's)
- Paper and pencils
- Overhead markers

Instructions:

1. Place students in pairs
2. Student pairs will measure wingspan of each student (from fingertip to fingertip when arms are extended) and record.
3. Student pairs will measure height of each student and record.
4. Each student plots the ordered pair (wingspan, x, and height, y) on the large coordinate plane.
5. Discuss the relationship and make predictions based on the graph.

Adaptations:

- Could continue by measuring other body ratios (example, fingertip to shoulder and fingertip to elbow) and graphing to find patterns.

References:

- None

Standard:

7th Grade	7.A.2.1	Students are able to write and solve one-step first degree equations with one variable.
8th Grade	8.A.2.1	Students are able to write and solve two-step first degree equations with one variable.

Purpose:

Students will write equations when given the value of a variable.

Materials needed:

- Desks
- Paper
- CD player
- Fast-moving music
- Pencils

Instructions:

1. On each piece of paper, write a variable and a value (x = -2).
2. Place one paper on each desk.
3. Students will stand next to their desks.
4. When teacher starts the music, students travel around the desks (moving to each beat of the music.
5. When the music stops, students must stop at a desk and write an algebraic equation using the correct value of the variable. (x + 2 = 0)
6. Continue game.

Adaptations:

- May take out one desk each time. Students who don't get a desk complete problems on the board.

References:

- Minds in Motion, 2004, pg. 53.